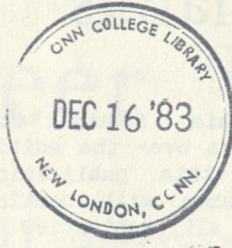
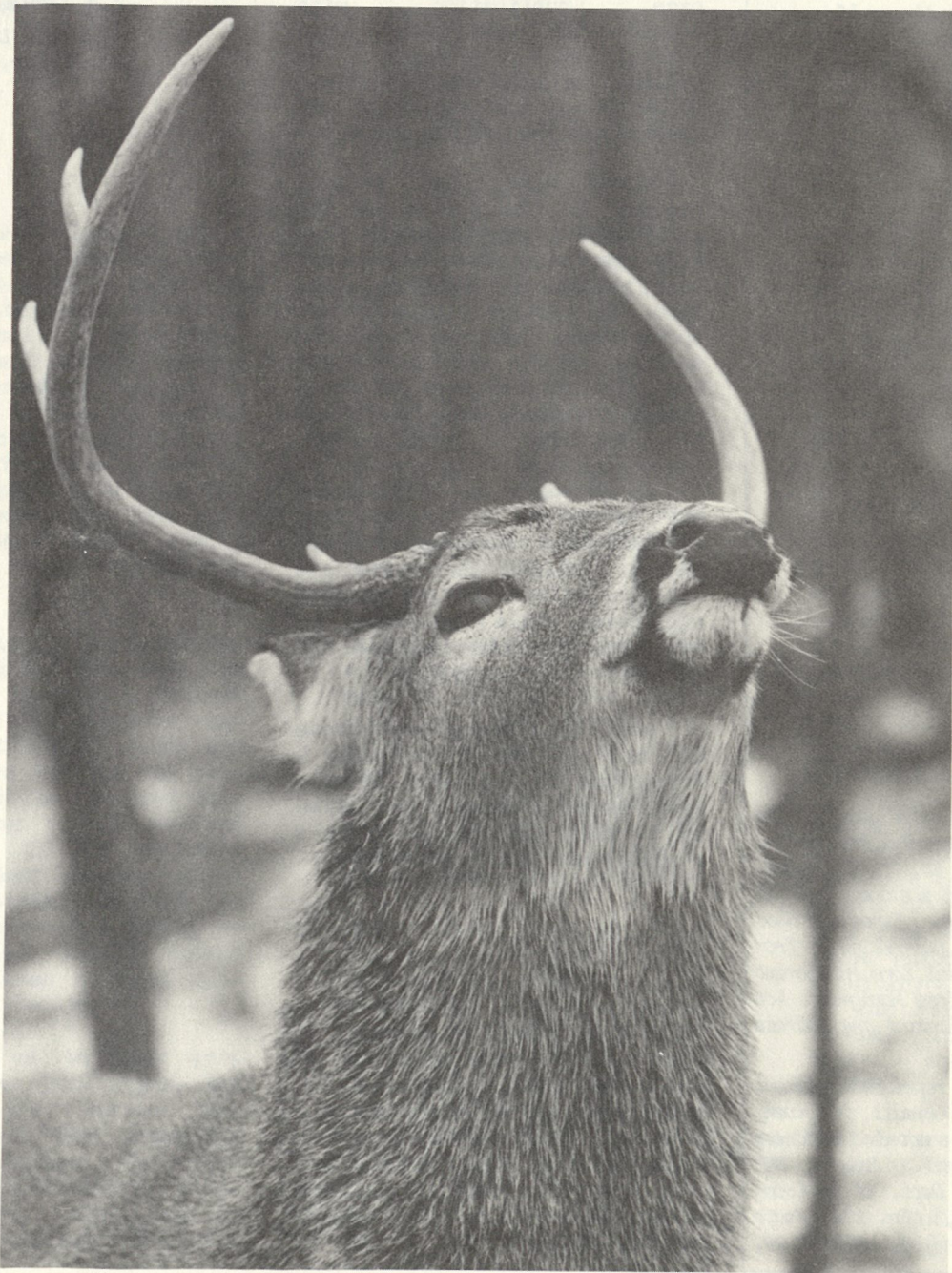


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# Citizens' Bulletin

Volume 11 Number 3 November 1983 \$5/yr.  
The Connecticut Department of Environmental Protection





# Citizens' Bulletin

November 1983

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Cover Photo: Aggressive white-tail buck. Leonard Lee Rue III.

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# Thanks

With this issue, John Speziale takes over the editing duties for this publication. Margot Callahan will continue supervising all activities in our public information program.

Since mid-1978, Margot has effectively guided the Citizens' Bulletin through a series of significant changes. In 1978 the Bulletin was a 20 page publication with considerably less than 4,000 subscribers. Today the publication size has increased to 24 pages, and the number of subscribers has nearly doubled.

There have been several changes in the format of the publication, all of which have made it more attractive and more readable. The computerized subscription list has been transferred between computer systems and the copy production has been transferred directly into the Information and Education Section.

In December of 1979 Margot was "promoted" to the position of Assistant Director, Information. Since that time she has carried out her new responsibilities while continuing to edit, and provide original material for, the Bulletin.

Most important, each issue of this publication has been a storehouse of valuable information, about a tremendous variety of subjects, presented in a readable and enjoyable style.

"The Connecticut Department of Environmental Protection is an equal opportunity agency that provides services, facilities and employment opportunities without regard to race, color, religion, age, sex, physical handicap, national origin, ancestry, marital status or political beliefs."

On behalf of all of you who have enjoyed the last five years of the Bulletin, and particularly for myself, I want to say thank you, Margot, for service above and beyond the call of duty. This is by no means a farewell, because Margot's influence will continue to be a major factor in the production of the Bulletin. Simply, thank you and good luck with the rest of the Section's business.

*William Delaney*  
William Delaney,  
Director, DEP I&E



# Deer Facts

We've all admired the state's  
deer population ---  
but did you know...?

There are almost thirty thousand deer inhabiting Connecticut. Most of us have come across one or more of these majestic animals at some time, catching them grazing in a clearing, bounding across a country road or leaping a stone wall. We have admired their grace and agility; and some of us have depended upon them for sport and food. But how much does the general public really know about these fascinating animals?

Did you know, for instance, that some deer can swim at speeds up to 13 miles per hour? Did you know that evidence suggests the antlers of bucks are not protective devices but sexual weapons to be employed only in the mating season to fend off rivals? Or did you know that most deer resist migration, oftentimes choosing to starve in their yards trying to conserve their energy rather than moving even a short distance to find food?

To help us to know more about our deer population, the State Wildlife Bureau has recently issued "Deer Facts," a pamphlet compiled by the Bureau's Julie Victoria, Wildlife Biologist. The text of the pamphlet follows. We think

you will find these "Deer Facts" interesting, informative and, perhaps, even a little surprising.

## SPRING:

1. Given good habitat and no predators, a deer herd will almost double in size every year.
2. The gestation period lasts between 196-200 days or six and one-half months.
3. Does usually give birth to a single fawn (immature male or female) the first time that they breed, and twins thereafter if food and living conditions are good. Triplets are common, quadruplets are known, and at least two sets of quintuplets have been recorded.
4. Male fawns weigh 20 percent more than female fawns and maintain this advantage throughout life, starting at five to six pounds at birth. There are usually more male fawns born than female fawns -- usually about 106 males to 100 females.
5. Fawns can stand 10 minutes after birth. They are

odorless for the first three or four days and nurse eight to ten times per day.

6. Deer milk has about three times as much protein and butterfat as our finest Grade 'A' cow's milk.
7. The yearling does will return to their dams (female parent) and bring their fawns, shortly after the adult does give birth, to form a family group.
8. Does with excessive amounts of testosterone (a sex hormone) will grow antlers. This occurs once in about 2,500-2,700 cases.
9. Antler growth is stimulated in May by photoperiodism (reaction to a variation in length of daylight hours). Eyes pick up increased daylight which stimulates the pituitary gland resulting in the release of testosterone, the sex hormone that controls antler growth.
10. Antlers are usually fully grown by the end of August.
11. Fawns double their birth weights in 15 days and dou-



ble again in another 15 days; by six months a fawn's weight has increased ten-fold.

12. At three weeks of age the fawns follow the dam and start to eat vegetation.
13. White-tailed fawns usually lose the spots on their coats at around 12 weeks.
14. Shedding of the summer coat begins in September. Deer sometimes retain two rows of spots (fawn spots) parallel to the backbone in the winter coat -- several records of adult deer have been made to verify this.
15. Deer keep cool on hot days by pumping body heat through their blood and into the lungs where it is drawn off by their rapid breathing with mouths open and tongue exposed (panting) -- deer do not perspire.
16. Deer need two to three quarts of water per 100 pounds of food in summer.

#### FALL:

17. In Connecticut, male fawns have been observed with one-half inch to one inch polished spikes; but normally only buttons.
18. Antler size is a result of relative nutritional value of food, not a function of age.
19. Usually the dominant bucks (adult males) peel velvet (the skin covering the growing antler) first. This normally takes 24 hours, but sometimes will take up to three days to complete.
20. A buck's neck starts to swell around the end of September and the first of October which begins the rutting season.
21. The bucks shadow box with saplings at this time (September-October) to strengthen neck muscles.

22. Bucks with antlers sawed off lose their belligerence and aggressiveness.

23. Although the bulk of their breeding takes place during a 60 day period, the season may extend to 120 days or more. In Connecticut, the earliest breeding has been October 20 and the latest February 15.

24. A weight loss of 25 percent to 35 percent is common in bucks during the rut (breeding season).

25. The physical condition of the majority of deer is best in November just prior to breeding season.

26. Bucks fight each other during the rut in a test of brute strength by pushing, throwing off balance, and trying to get under to plunge antlers into the other's body. Patches of hair are often knocked out in aggressive kick encounters.

27. The fact that bucks drop antlers prior to or during the winter months of hardship (when most needed for protection) suggests that antlers are sexual weapons, not protective devices.

28. Estimated usable pounds of venison are computed using 45 percent of the deer's live weight.

#### WINTER:

29. Deer normally shed their antlers from the middle of December to February. Bucks in the finest condition, with the largest racks, usually drop their antlers first. Penned bucks, not breeding, have carried antlers into March and April.

30. Bucks shed their antlers sooner when the weather is cooler.

31. Deer will lose 12 percent to 15 percent of their body weight in winter even if

food is available, because lower metabolic rates require less food intake.

32. During the winter, most of the deer activities occur during the daylight hours. Deer become active about 8:00 a.m.

33. Winter deer hair is longer and denser than summer hair. Deer hair is crinkled and contains air cells (hollow). There are, however, twice as many summer hairs as winter hairs in a deer's coat. This is thought to be for protection from insects.

34. Fawns, which are about two-thirds of the dam's size in late autumn, slow down their growth rate until spring. All intake in late autumn, above that which is converted by basic metabolism, goes to fat.

35. Deer with any fat on the body have a very high fat content in the bone marrow. Body fat is put on beneath the skin over the back and hams. Next, fat is stored under the belly skin, in the abdominal cavity around the organs -- a "fishnet" of fat envelopes the intestines.

36. Back and ham fat on a deer is the first to be utilized in the winter -- then abdominal cavity fat and finally bone marrow fat.

37. Bone marrow color ranges from white to yellow to pink to red depending on food availability. Well nourished deer have pure white bone marrow which contains about 90 percent fat.

38. When hunger is severe, deer will eat browse up to the size of a pencil. Normally they prefer browse no thicker than a matchstick (tender shoots, leaves and twigs).

39. Fawns have been known to go a month without food. Adult does may go for as



long as two months without a mouthful.

40. Deer start stripping bark from young trees when browse is no longer available.
41. Deer normally require 10-12 pounds of food a day, gathered in one to two hours, but can get by on two to three pounds per day.
42. Deer need one and one-half quarts of water per 100 pounds of food daily in the winter, except that much of the water requirement is met by vegetation.
43. Does that are in areas of poor habitat give birth to one fawn, rather than the usual two.
44. Although there are no true wintering yards in Connecticut there are "concentration areas" during periods of extreme winter conditions. The purpose of yarding is twofold: a) to protect deer from the weather (especially wind); b) to tramp out networks of trails to food in wintering areas.
45. Winter deer yards have two main disadvantages: a) rapid consumption of food; b) vulnerability to predators.
46. Aggression is very common in deer yards -- bucks over does, dominant does over subordinate does, fawn vs. fawn. Family groups are based on a pecking order oldest down to underlings.

#### GENERAL:

47. Deer are fully mature at three and one-half to four and one-half years. Deer have a potential life span of 11-12 years, however, in Connecticut the average life span is three and one-half years.
48. Deer have been clocked swimming at 13 m.p.h. and



Leonard Lee Rue III

*A starving fawn. Deer starve in yards trying to conserve energy, rather than move even a few miles to abundant food.*



Len Rue, Jr.



*Deer have been clocked swimming at 13 m.p.h. and have traveled up to 5 miles.*

Leonard Lee Rue III



*Eighteen minute old fawn walking. Fawns can stand ten minutes after birth.*



have traveled up to five miles.

49. Deer running speeds on land have been measured between 35 and 40 m.p.h. when spooked, but only for short distances.

50. Leaps spanning 28-30 feet have been recorded for white-tailed deer.

51. Deer have been observed jumping over eight foot fences from a standing position.

52. Deer have gone through barbed wire fences with strands one foot apart and seldom touch the strands. A yearling deer can pass through the mesh of a standard cattle fence (approximately eight by twelve inch opening).

53. Seventeen subspecies live within the continental U.S.A.

54. Florida Key deer are the smallest subspecies in the Eastern United States (seldom weighing more than 80 pounds and standing over 28 inches high).

55. Young bucks require about twice as much protein and nutrients as mature three year olds for growth.

56. Deer are crepuscular: most active in the twilight hours before sunrise and after sunset.

#### APPEARANCE:

57. Deer melanism, black, and true albinos, white, are very rare.

58. "Partially white," are not rare. Three to eight out of 12,000-13,000 deer a year are white mottled, called "piebald" deer.

59. Deer do not have front teeth on the upper jawbone.

#### BEHAVIOR:

60. In heavy showers or thunderstorms, deer take shel-

ter. If deer are seen feeding in hard showers then it will probably storm for a few days.

61. Deer feed earlier if it is dark or stormy or if the moon is in the new phase and light is minimal.

62. Deer use ridges and hills during the day as sunlight starts heat thermals of air rising, which carries scents from below up to be sensed. Deer use lowlands at night; as air cools, it settles, bringing scents from above hillside down to be classified.

63. A deer's home range is the smallest in the summer as the requirements of food, shelter, and water are met more easily.

64. Only about 20 percent of the white-tailed deer disperse more than one and one-half miles. They spend most of their lives in an area composed of about one square mile of habitat which can vary in length and/or width.

65. White-tailed deer are not migratory in the true sense. They may, however, travel two to three miles to a yard and sometimes up to 15 miles.

66. Deer resist the impulse to move a short distance. They would starve in yards trying to conserve energy, rather than move even a few miles to abundant food.

#### COMMON DISEASES:

67. Papillomas are deer warts which grow hard and warty on the skin. Fibromas are lesions which develop and look as if a scab has been knocked off. Lipomas occur rarely and are tumors found in a deer's fatty tissues. All are caused by viral infection.

68. Rumenitis is bloat that occurs when too much high

carbohydrate food is taken in at one time, such as corn, sugar beets, grapes, pears, wheat, and wind-blown apples. When dropped apples are exposed to air the inside ferments and deer eating them appear drunk.

#### ENEMIES:

69. Dogs probably take a greater toll on deer than all other wild predators combined.

70. Deer chased and dying of exhaustion will have frothy blood filling the lungs.

71. Snowmobiles causing deer to run in panic cost each deer as many extra calories as would ordinarily be used in one month of normal living; deer simply can't afford this in winter.

72. In Connecticut, approximately five percent of the total deer population ends up as reported road kills.

73. About \$60 million worth of damage is caused per year by deer/vehicle collisions in the U.S.A.

74. Estimates of white-tailed deer in the U.S. by the U.S. Fish and Wildlife Service census method indicates 12.5 million animals.

75. Although expensive, aerial surveying is the most common and most accurate method of counting deer. Deer seen against a snow background from a low flying helicopter are counted.

76. Estimates from Connecticut's 1974 aerial survey indicated 19,100 animals. Surveys conducted since 1975 document the following:

1975: 19,700 deer  
1978: 22,500 deer  
1983: 25,500 deer

All surveys were conducted during the months of January and February.



# The Great Shad Migration

## (with a little help from DEP's Marine Fisheries Program)

By Susan Subak, Environmental Intern

From mid-April to mid-June, anadromous American shad ascend the Connecticut River to their spawning grounds after returning from their fall and winter feeding migration in the coastal Atlantic Ocean. Anadromous fish live in salt water but spawn in fresh water and include shad, salmon, alewives, blueback herring, sea lamprey, brown trout, striped bass and rainbow smelt. Shad fishing has become very popular in Connecticut both as a sport and as a commercial fishery. During the height of the run in June of 1982, recreational fishermen caught approximately 40,000 of the estimated 730,000 shad in the River, and 39 commercial boats reported a take of about 67,000 shad.

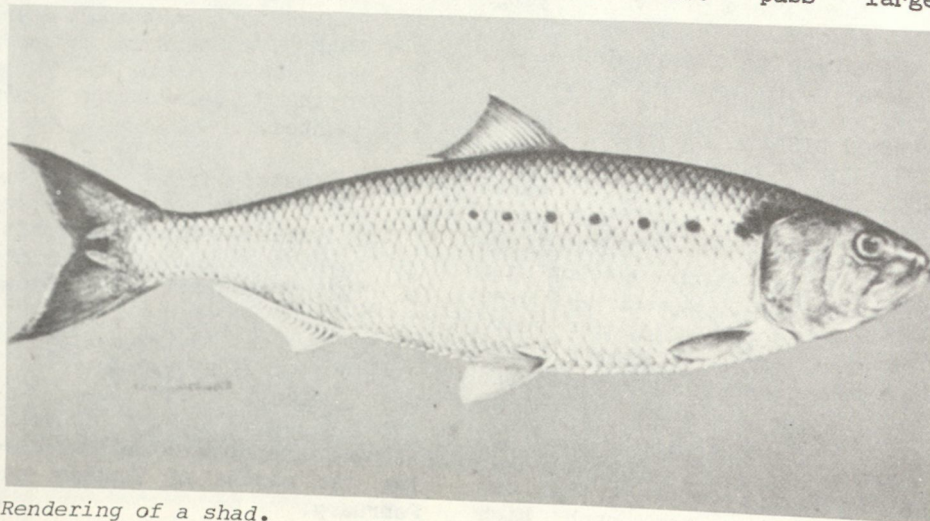
Shad return to the Connecticut River in great numbers, and are moving further upriver

each year. Bellows Falls, Vermont, was once the northern limit of their spawning ground due to the natural falls at that location. This year the shad have reached Bellows Falls for the first time since 1796. The progress is due to improvements in and construction of fishways, which are located at Holyoke and Turners Falls, Mass., Vernon, Vt., and Bellows Falls. At Holyoke a fishway has been in place on the Connecticut for the past 28 years but it has been modified in recent years. The Holyoke Dam in Massachusetts contains a fish lift or elevator, the only one of its kind along the Connecticut. The shad swim into an attraction channel, which leads into a hopper which is lifted to the higher water level of the impoundment. The lift was constructed in 1955 but did not pass large

numbers of fish until it was expanded and improved in 1975. The number of shad passing annually has increased steadily from 5,500 in 1955 to over 525,000 in 1983.

The remaining Connecticut River fishways are of the fish ladder variety and have been financed by the power companies operating the dams. At the Rainbow Fishway on the Farmington River, recent modifications in the ladder operation allow the shad to make their way through without delays. Previously, shad were delayed in the fishway trap pool until captured salmon were collected for spawning purposes. Because of the delay, many shad would lose interest in the journey and loiter in the pool or head back downriver. Now quick release gates catch the salmon soon after they are sighted, and the shad are free to move uninterrupted from pool to pool. In 1981, 34 percent of those arriving passed the Rainbow Dam fishway on the Farmington River after negotiating the 60 pools. The remaining shad died or turned and headed downriver. In 1982, 64 percent successfully passed the dam. While some fish do not survive the stress of crowding and moving through elevators or ladders, survival for most would be impossible without such devices.

The fishways extend the shad and salmon range further upriver than previously, making



Rendering of a shad.



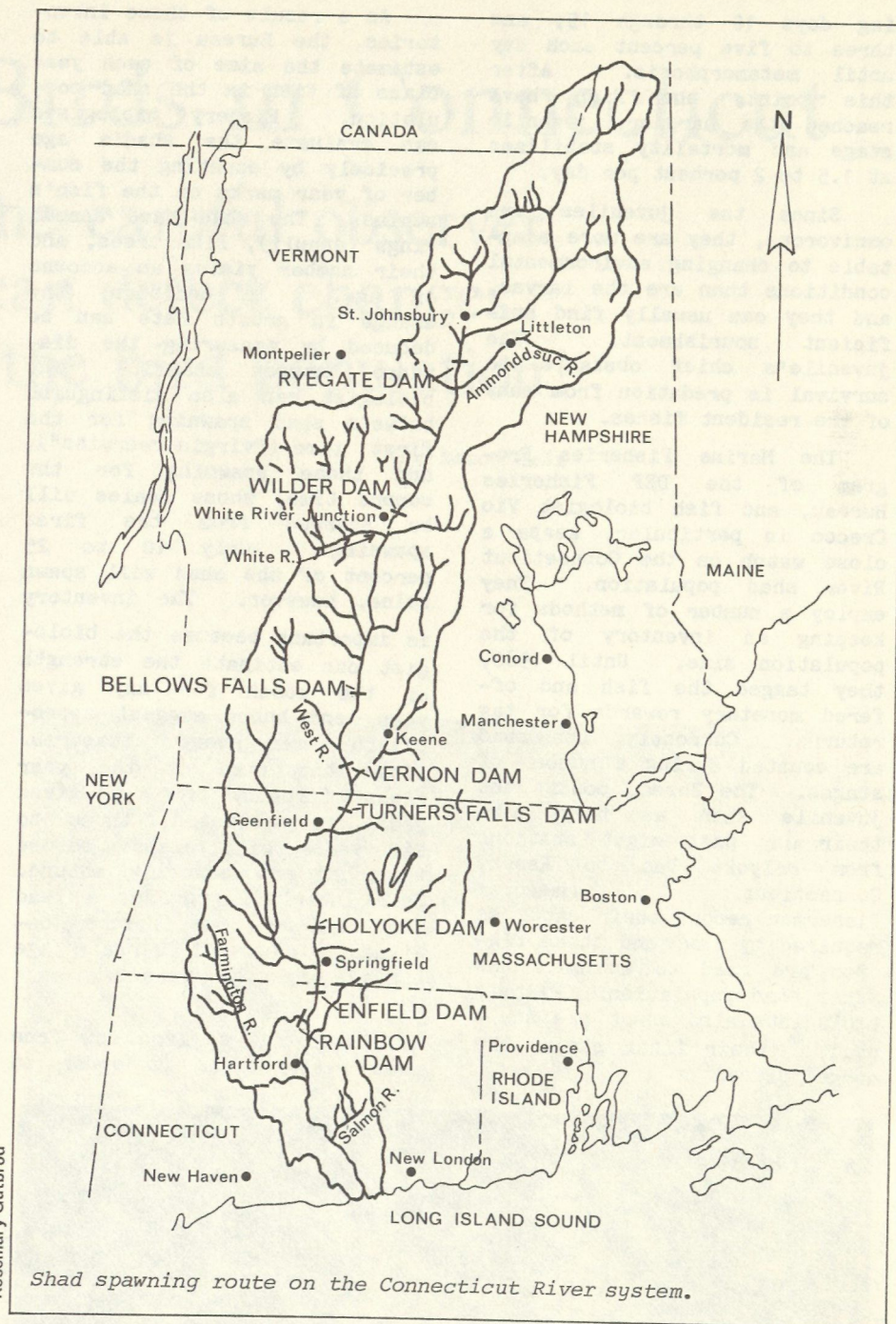
sport fishing available in Massachusetts, Vermont and New Hampshire. But paradoxically, while the fishways provide access to northern spawning grounds, they may potentially hinder the shad's survival, for the more dams a fish passes on its spawning run, the more obstacles the juveniles face as they pass back through the dams and out to sea.

While gains in the number of fish reaching the northern spawning grounds on the Connecticut confirm the success of the fishways, a large shad run does not necessarily mean a high number of surviving progeny, as shown most dramatically in 1982. At this time, the largest number of shad in the past four years passed the Rainbow Dam Fishway but the lowest proportion of young survived. The reason for this anomaly is believed to be the heavy rain in mid-June which resulted in high water levels and low water temperatures during the peak spawning weeks. It is believed that these conditions resulted in poor survival of young shad.

Spawning usually takes place in early June. The eggs hatch between 5 to 20 days after the spawning, depending upon the water temperature, and eggs that were spawned early in the season hatch last because the cooler water temperature delays their development. When the eggs hatch, the fish enter the larval stage, which is the most vulnerable period for the shad. The newly hatched offspring look less like fish than like thin white noodles with black eyes. One month after spawning, however, these "archaic" appearing fish larvae metamorphose into "juveniles," which live in the river for about three months before heading, in October, to the ocean where they remain until it is time to spawn, which for the males is between the ages of three and five, and for the females, between the ages of four and six years.

The success of the spawning season, interestingly enough,

Rosemary Gutbrod



depends less upon the number of shad returning to the river than it does on the water flow. It is believed that high water levels decrease the larvae's chance for survival, because as the water level increases, the river becomes more turbulent and disperses colonies of zooplankton which are the larvae's chief source of food. Consequently, the larvae may have a more difficult time identifying the scattered plankton. Moreover, when

the water level increases, the water temperature declines, and the zooplankton's chances of surviving and reproducing are diminished.

The mortality rate of the young shad is very high. Of the 250,000 ova produced by a single shad, an average of two young fish survive to maturity. The mortality rate lessens with time: for the first five days, 20 to 25 percent die per day; 10 to 15 percent dur-



ing days 10 through 15; and three to five percent each day until metamorphosis. After this point, the fish have reached the hardier, juvenile stage and mortality stabilizes at 1.5 to 2 percent per day.

Since the juveniles are omnivorous, they are more adaptable to changing environmental conditions than are the larvae, and they can usually find sufficient nourishment. The juvenile's chief obstacle to survival is predation from many of the resident fishes.

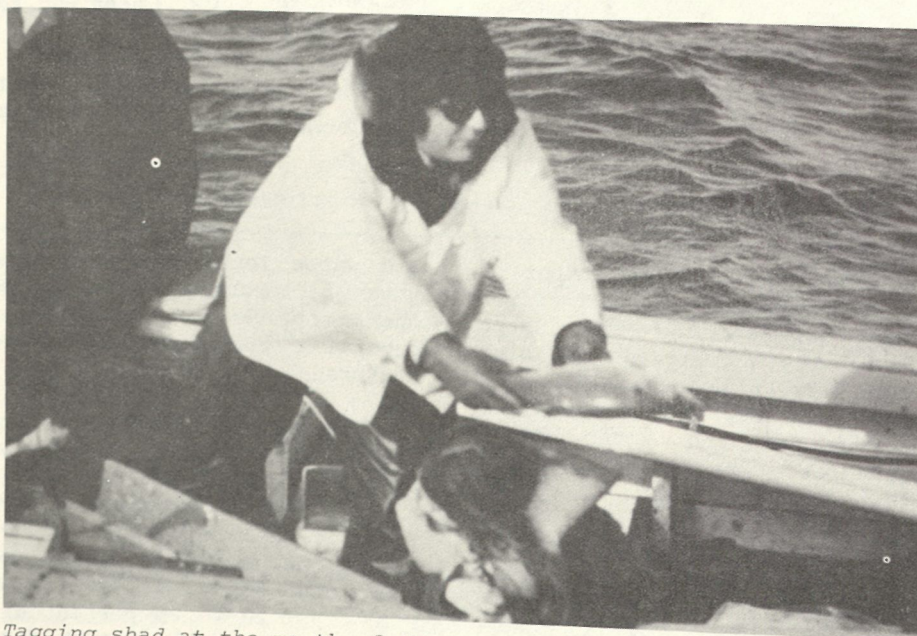
The Marine Fisheries Program of the DEP Fisheries Bureau, and fish biologist Vic Crecco in particular, keeps a close watch on the Connecticut River shad population. They employ a number of methods for keeping an inventory of the population size. Until 1980, they tagged the fish and offered monetary rewards for tag returns. Currently, the shad are counted during a number of stages. The Bureau counts the juvenile shad as they make their way past eight stations from Holyoke Dam to Essex, Connecticut. Commercial fishermen report their catch as required by law, and these figures are used to estimate the adult shad population. Fishery biologists also count the adult shad at their final stage, the market place.

As a result of these inventories, the Bureau is able to estimate the size of each year class of fish in the shad population. Fishery biologists can evaluate the shad's age precisely by counting the number of year marks on the fish's scales. The shad have annual rings (annuli), like trees, and their number yields an account of age. In addition, the change in growth rate can be deduced by measuring the distance between annuli. The biologist can also distinguish between shad spawning for the first time ("virgin recruits"), and those spawning for the second time, whose scales will be scarred from the first spawning. Only 10 to 25 percent of the shad will spawn twice, however. The inventory is important because the biologist can estimate the strength of the stock for any given year, and hence suggest appropriate management measures. After the size of the year class (progeny for a given year) is estimated, three to six years will elapse before the shad are sexually mature. This interlude provides a lead time before restrictions designed to protect certain age classes might be imposed.

As it is, anglers now face some restrictions in order to

insure the preservation of the shad population. Sport fishermen are only allowed to keep six fish per angler. Because the commercial fishermen may only use multi-filament gill nets as required by law, they are forced to fish at night, so that the fish will not see the netting (save for overcast days, or periods when the water is murky). Moreover, commercial fishermen are permitted to fish only five days of the week.

Since shad migrate across several state and even national boundaries, management and enhancement of the species must also be interjurisdictional. The status of the Connecticut River population is monitored as part of a regional program called the Connecticut River Anadromous Fish Program. In order to coordinate the management of the shad, as well as all other anadromous fish, DEP's Anadromous Fisheries biologist, Pete Minta, meets with similar representatives from each state in the Connecticut River Basin, which includes Massachusetts, New Hampshire, and Vermont as well as representatives from the U.S. Fish and Wildlife Service and the National Marine Fishery Service, to plan research and management strategies and report research results. The program monitors the fishways along the Connecticut, overseeing the design and modifications for innovations such as the shad/salmon sorting gate mentioned previously, and diagnosing and treating certain anadromous fish diseases. The committee is also responsible for all technical aspects associated with anadromous fisheries management and restoration in the river basin and for advising a Policy Board with respect to long range planning. The aim of the program is to increase the size of the shad stock native to the Connecticut River and to restore the shad to their historic range. By the look of this year's shad migration upriver, their success is obvious.



Tagging shad at the mouth of the Connecticut River.



# "New" Birds in Connecticut

The careful observer  
can detect changes  
in the bird population!

By Nancy Kriz

Bird populations often change in terms of numbers in a specific area, but actual species of birds observed within an area tend to vary little. Year after year at our winter feeding stations, we all note the chickadees, purple finches, nuthatches, grosbeaks, etc. Spotting a "new" bird, however, is an event! Serious bird watchers, though, should be aware that the possibility of a new species entering a given territory is real. For example, the cardinal was not seen in Connecticut during the winter months until about 50 years ago. Now almost every feeding station has its pair of cardinals.

Most of us think of the mockingbird as being a southern species. Alden Miller, in Song and Garden Birds of North America, writes, "Moonlight, magnolias, and the mockingbird -- these are enduring symbols of the Old South." Barring a tremendous change in climate, we in Connecticut shall never have true magnolias, but we do now have large numbers of mockingbirds -- even in the winter.

Another "new" species Connecticut bird watchers are beginning to recognize is the house finch. (The male house finch can be differentiated from the male purple finch by the dark brown stripes on its sides and by a red "head band." I find it very difficult to distinguish the females of these two species from one another. However, the female house finch is said to have a paler face).



Irene Vandermolen — — Leonard Rue Enterprises

An osprey at nest. "Along the Connecticut River and in adjacent tidal wetlands, the osprey is presently exhibiting a phenomenal recovery."



An intriguing story accompanies the house finches' introduction to New England. House finches (Carpodacus mexicanus) were originally native to the western states. Their diminutive size, their musical song and their bright colors made them attractive to bird dealers on the West Coast. In 1940, house finches were captured in California and shipped to New York City to be sold to wealthy socialites. (It was apparently "the rage" at that time to collect rare bird species.) The New York bird dealers referred to the house finches as "Hollywood finches" to help promote sales. Of course, the trapping and interstate shipping of these birds was illegal, and the "Feds" eventually caught on to the dealers' activities. The dealers, who became aware that the government agents were closing in, released the caged house finches in New York City.

House finches have been observed in southern

Connecticut since the early 1960s. Quite rapidly thereafter, their numbers increased and their territories were extended. House finches are now seen as far north as New Hampshire and Vermont. A documented report was received by the author from Benjamin Morgan of the Science Department of Pomfret School in Pomfret, Connecticut, which stated that he first observed house finches in northeast Connecticut in October of 1978. Professor Morgan's account continued by recalling that "in May of 1980, one pair (of finches) was incautious enough to nest in a potted spider plant hanging from the headmaster's porch..."

We are all aware of the damage wrought by DDT and other toxic pesticides. A number of bird species in our State came close to extinction. However, since the use of these pesticides was outlawed, previously prevalent species have begun to reinhabit their former breeding grounds. Along the Connecticut River and in the adjacent tidal

wetlands, the osprey is presently exhibiting a phenomenal recovery. The ospreys' presence is becoming an accustomed sight rather than a rarity. The ospreys, too, have become used to humans and human activities. One pair of ospreys nested this past spring in a lighted buoy (#8) off Saybrook Point. The osprey pair seemed undaunted by the hundreds of boaters passing by each weekend who stopped to marvel at the sight of the two chicks peeking out over the edge of their floating nest. (At last observation on August 29, 1983, the fledglings were perched on top of the buoy and were ready to fly.)

In Connecticut, bird species and their populations really do change. So, keep an eye out for the "new" arrival at your feeders, in your yards, or as you travel about on weekends or vacations. Bird watching can be an exciting avocation which the whole family can enjoy and from which everyone can learn and profit. ■

## Gift Idea!

### Connecticut Outdoor Special

The Connecticut Forest and Park Association announces a "Connecticut Outdoor Special": books on the outdoors at significant price reductions. The Connecticut Outdoor Recreation Guide, regularly priced at \$4.40, is now only \$3 per copy. The guide contains brief descriptions of state forests, parks and private sanctuaries. It also provides historical information and directions.

Also available at a "Connecticut Outdoor Special" price is a package which includes the guide mentioned above, plus the thirteenth edition of the Connecticut Walk Book and a pocket manual entitled Forest Trees of Southern New England. The Walk Book is the newest guide to the 500 miles of Blue Blazed Hiking

Trails, and the Trees manual names and describes forty-eight forest trees with line drawings and simple keys for identification. Purchased separately, these publications would cost \$14.40. But the "Special" price is just \$12.33 per set, including tax, postage and handling.

More information and order forms can be obtained from the Connecticut Forest and Park Association, 1010 Main St., P.O. Box 8537, East Hartford, 06108. ■

## Interesting Events

Nov. 25 - Jan. 1  
HARTFORD

Festival of Light, Constitution Plaza, daily, dusk - 10 p.m. Contact: L. Skilton, Corporate Communications Dept., Travelers

Insurance Co., One Tower Square, Hartford 06115, 277-3476.

Dec. 1 - 22  
MYSTIC

Christmas Tours at Mystic Seaport, "Christmas at Sea and Ashore" escorted tours for groups of ten or more, reservations required. Contact: Lisa Brownell, Mystic Seaport, Mystic 06355, 572-0711.

Dec. 3 - 4, 10 - 11  
EAST HAVEN

Santa on the Trolley, Branford Trolley Museum, 11 - 5, adults \$3, seniors \$2.50, children \$1.50, under 5 free. Contact: Howard Williams, 17 Pondwood Court, Hamden 06514, 222-2318.

Dec. 9  
GLASTONBURY

"Music in the Meadows" at Holland Brook Connecticut Audubon Society. Christmas Concert with Lui Collins, 8 p.m., adults \$4, seniors and children under 12, \$3. Contact: Holland Brook Center at 633-8402. ■



# New Legislation

## Acts pertaining to environmentalists and sportsmen from the 1983 session of the General Assembly

The following acts passed during the 1983 session and the special June session of the Connecticut General Assembly are of interest to environmentalists and sportsmen. Summaries of the acts were prepared by the Office of Legislative Research, along with explanations and comments on many of the new laws. The following are summaries or excerpts of these.

SA 83-1, AN ACT MAKING APPROPRIATIONS FOR THE FISCAL YEAR ENDING JUNE 30, 1984 (June session).

Appropriates the following to the Department of Environmental Protection:

Central Office:	\$ 4,460,109
Division of Conservation & Preservation:	13,604,899
Division of Environmental Quality	3,645,088
Total	\$21,710,096

PA 83-17, AN ACT CONCERNING THE AUTHORIZATION OF BONDS OF THE STATE FOR CAPITAL IMPROVEMENTS AND OTHER PURPOSES, effective July 1, 1983 (June session).

Authorizes the issuance of bonds of the State for projects, including, for the Department of Environmental Protection: 1) improvements and renovations to recreational areas, not exceeding two million dollars; 2) dam repairs

including state-owned dams, not exceeding \$1,775,000; 3) grants in aid to resource recovery authorities, not exceeding two million dollars; 4) a grant in aid to Waterbury for construction of a regional solid waste facility, not exceeding three million dollars; 5) land acquisition and development at West Rock Ridge State Park, not exceeding one million dollars; 6) West River watershed protection and flood control project, not exceeding one million dollars; 7) beach and shore erosion control and watershed protection and flood control projects, not exceeding five million dollars; 8) grants to municipalities for open space land acquisition and development, not exceeding two million dollars; 9) for Silver Sands State Park landfill closure and Great Creek drainage improvements, not exceeding \$6,500,000; 10) loans for dam repairs and improvements, pursuant to legislation passed by the June 1983 special session.

PA 83-33, AN ACT INCREASING THE BOND AUTHORIZATIONS FOR CERTAIN CAPITAL IMPROVEMENTS (June session).

Among other things, this act increases the bond authorization for water pollution control projects from \$339,000,000 to \$347,000,000.

PA 83-287, AN ACT CONCERNING ZONE CHANGES IN COASTAL AREAS, effective October 1, 1983.

Under the law zone changes by coastal towns with approved municipal coastal programs must be consistent with the goals and policies of the State's Coastal Area Management Program. Under prior law, the Commissioner of the DEP, which administers CAM, had to review, comment, or suggest modifications to these zone changes within 45 days of submittal to him. This act requires a zone change by any town in the coastal boundary, regardless of whether it has adopted a municipal coastal program, to be consistent with CAM goals and policies. The Commissioner must be notified of the proposed zone change at least 35 days before the start of the hearing on the change. Under the act the Commissioner may continue to comment and make recommendations on the zone change. These comments must be considered by the appropriate local board or commission before a final decision is made. Failure of the Commissioner to comment does not mean approval or disapproval of the zone change.

PA 83-525, AN ACT CONCERNING THE COASTAL AREA MANAGEMENT ACT, effective October 1, 1983.



This act makes several changes in the coastal management law concerning exemption of single family homes from site plan review, action on site plans, state action within the coastal boundary, and board or commission procedures.

#### Division of Conservation and Preservation

PA 83-50, AN ACT CONCERNING SAILBOARDS, effective upon passage

This act exempts sailboards from the requirement that a personal flotation device (life preserver) be carried on the vessel. The act defines a sailboard as a sailboat whose unsupported mast is attached by a swivel or flexible universal joint to a surfboard-like hull. The act also allows the hull to be considered a personal flotation device when the mast is secured to the hull with a leash or safety line.

PA 83-191, AN ACT CONCERNING FISH AND GAME, effective upon passage.

This act makes numerous minor changes in the fish and game laws regarding permits for possession of wild animals, harassment of bald eagles, raw fur licenses, collection of fish and wildlife for scientific and educational purposes, deer killed by motor vehicles, and fishing near fishways.

#### Molestation of Bald Eagles:

Under the law, hunting, killing or attempting to kill a bald eagle carries a fine of up to \$100, not more than 30 days imprisonment, or both. This act imposes the same penalty for disturbing, molesting, or harassing a bald eagle.

#### Wild/Dangerous Animals:

Prior law required individuals to obtain a permit from a municipality's chief executive authority before certain potentially dangerous wild animals such as lions and bears could be legally possessed. This act forbids possession of dangerous animals, but does not apply to municipal parks, zoos or nature centers, museums, research facilities where such animals are kept in strict confinement, or to those animals in legal pos-

session before the act's effective date.

Raw Fur Licenses: This act requires persons with licenses to engage in the business of buying raw furs produced in the state to report their buying activities to the Commissioner of Environmental Protection. The Commissioner may revoke a license for failure to report. The act also changes the license renewal date from December 31 to June 30 for consistency with the state fiscal year. Licenses issued during 1983 are valid until July 1, 1984, without payment of an additional fee.

Collector Permits: Under the law, the Commissioner of Environmental Protection may issue permits to collect crustaceans and wildlife and their eggs and nests for scientific and educational purposes. This act includes fish under such permits and allows the Commissioner to set the permit term instead of requiring automatic expiration on December 31 as under prior law. The Commissioner is also authorized to determine the collection method.

Deer Killed by Motor Vehicle: This act allows deer killed or seriously wounded by a motor vehicle to become property of the vehicle owner only after issuance of a copy of a deer kill incident report.

Fishing Near Fishways: Under prior law, taking fish was not permitted within 500 feet below any fishway except by sport fishing. This act prohibits taking fish within 250 feet of a fishway and gives the Commissioner power to extend or reduce that distance. Any change in the distance must be posted.

Under Sixteen Fishing: This act makes it clear that persons under 16 do not need a license to fish.

PA 83-253, AN ACT CONCERNING CLARIFICATION OF VESSEL REGISTRATION REQUIREMENTS RELATED TO USE UPON THE WATERS OF CONNECTICUT, effective upon passage.

This act specifies that launching, mooring, or operat-

ing a vessel in state waters constitutes use of the vessel in the state for purposes of the boat numbering laws. Vessels numbered in Connecticut must pay the Commissioner of Motor Vehicles a fee that increases with the length of the boat according to a statutory schedule.

PA 83-262, AN ACT CONCERNING LOBSTERS, effective upon passage.

This act makes the following changes to the statutes on the taking of lobsters: 1) prohibits the issuance of a lobster license to a non-resident under certain circumstances; 2) limits the taking of lobsters by the use of trawls until July 1, 1985; and 3) amends the statutory penalties for taking short lobsters and adds penalties for taking an excessive number of lobsters through incidental trawling.

Lobster Licenses: Licenses to take lobsters and crabs (other than blue crabs) for personal or commercial reasons by the use of more than 10 lobster pots or by trawls cost \$100 for residents of Connecticut and \$150 for nonresidents. License seekers for states that do not issue commercial lobster licenses to Connecticut residents are limited to taking fish and crabs other than bluecrabs by use of trawls. This act prohibits issuing a commercial fishing license for lobstering or trawling to a nonresident if his own state has lobster-taking laws less restrictive than Connecticut's.

Taking of Lobsters by the Use of Trawls: The law allows lobster taking by pots, traps, trawls, or similar devices, or by skin diving or by hand. Under this act, lobster taking by trawls in certain state waters is limited to 100 lobsters taken as an incidental catch. This limitation applies to vessels operating in state waters at a point approximately at the eastern edge of Milford west to Greenwich and is effective until July 1, 1985.

Penalties: Anyone violating the laws on lobster taking can



be fined between \$25 and \$200, or imprisoned for up to 30 days or both for each offense. This act makes the penalties for taking short lobsters or for violating the incidental taking of lobsters limitation as follows: \$25 for the first offense; \$50 for the second, and \$100 for the third.

PA 83-440, AN ACT CONCERNING DEER HUNTING, effective October 1, 1983.

Under prior law, the Commissioner of DEP could issue a free "landowner deer permit" to the owner of 10 or more acres and also to the owner's spouse and any lineal descendants. The total number of permits was limited to one for the first 10 acres of land owned and one for each additional 20 acres. This act makes the landowner's parent or grandparent eligible for such a deer permit and eliminates any acreage requirement, beyond the initial 10 acres, in determining the number of available permits. The act also removes the restriction that only one deer could be taken by use of a rifle, shotgun, or muzzleloader under a landowner deer permit between November 1 and December 31.

The act also eliminates the wearing of fluorescent orange clothing required for archery deer hunting, for hunting raccoon and opossum from one-half hour after sunset to one-half hour before sunrise, and for deer hunting by a landowner on his property.

The law requires the Commissioner of DEP to establish regulations for deer hunting, including permit eligibility. This act makes it clear that these regulations are to be adopted according to the Uniform Administrative Procedures Act.

#### Other

PA 83-34, AN ACT PROHIBITING THE TAKING OF SHELLFISH FROM CONTAMINATED AREAS, effective October 1, 1983.

This act prohibits the taking of shellfish from areas where they have been trans-

planted or which have been designated as contaminated by the Commissioner of Health Services except in accordance with a commercial harvester's certificate or transplanting permit issued by the Commissioner.

PA 83-118, AN ACT CONCERNING HARVESTING OF SHELLFISH, effective October 1, 1983.

Under prior law, only oysters could be taken by power dredging equipment on private shellfish grounds. This act allows taking of other types of shellfish or shells by power dredging on these grounds. The act also restricts taking certain kinds of clams by power dredging where they are not located on private grounds.

PA 83-245, AN ACT CONCERNING THE RECREATIONAL HARVESTING OF CLAMS, effective October 1, 1983.

This act establishes a limit of one bushel per person on recreational harvest of clams, where there is no contrary statute, regulation, or local ordinance. The act also allows the Commissioner of Agriculture to designate, by regulation, areas exclusively for recreational clam harvesting. "Recreational harvesting" is defined as collection of clams by an individual for his own or his family's consumption. The act changes the penalty for violation of residency and quantity limits from a \$100 fine to an infraction.

Finally, the act makes it illegal to collect shells or shellfish between sunset and sunrise from the state's shores or any of its waters instead of only from navigable waters and eliminates a special exception to this law which allowed taking clams off Branford between May 1 and October 15.

#### Division of Environmental Quality

PA 83-237, AN ACT CONCERNING DELEGATION OF THE AUTHORITY OF THE COMMISSIONER OF ENVIRONMENTAL PROTECTION, effective October 1, 1983.

This act allows the Commissioner to delegate the

authority to inspect in connection with the enforcement of some environmental quality programs to a State, regional, or local agency or employee with their consent. The Commissioner is required to adopt regulations that describe the extent of the delegation of the authority to the agent. Despite any delegation, the Commissioner retains the right to act in regard to these environmental quality programs, with his decision preempting any decision of the agent.

PA 83-555, AN ACT CONCERNING FEES FOR ENVIRONMENTAL QUALITY PROGRAMS, effective October 1, 1983.

The Commissioner of DEP may require the payment of fees to cover DEP's reasonable costs in reviewing applications for and monitoring compliance with various state and federal permits, licenses, orders, and certificates. This act requires that fees be paid prior to the Commissioner's final decision on an application. The Commissioner may postpone review of an application until the fee is paid. Also, fees paid for monitoring compliance with the terms of a permit must be made at the time determined necessary by the Commissioner. This payment is required for the application approval to remain valid.

PA 83-69, AN ACT CONCERNING VIOLATIONS OF ENVIRONMENTAL PERMITS AND THREATS TO THE PUBLIC HEALTH, effective October 1, 1983.

The law allows the Commissioner of Environmental Protection to issue a cease and desist order without prior hearing where a person is engaging in or maintaining any condition or activity which may result in imminent and substantial damage to the environment. A hearing must be held within ten days of the order.

This act allows the Commissioner to issue such an order where there may be damage to public health. The act specifies that the Commissioner's public health powers are limited to his jurisdiction



under the wetlands, noise pollution, hazardous waste, radiation, solid waste, water pollution, and air pollution laws. The act also allows the Commissioner to issue this type of order for substantial and continuous violation of a permit which he has issued.

#### Air Compliance

SA 83-46, AN ACT CONCERNING THE ESTABLISHMENT OF HIGH RISK HAZARDOUS AIR POLLUTANT STANDARDS, effective upon passage.

The Commissioner of Environmental Protection shall report to the joint standing committee on the environment by February 15, 1984, with recommendations for a comprehensive program for controlling emissions of high risk hazardous air pollutants. The recommendations shall include, but not be limited to, consideration of standards or best available control technology to control emissions of such pollutants.

PA 83-159, AN ACT CONCERNING BUSINESS OR COMMERCIAL EMISSION TESTS, effective upon passage.

Under existing State regulation, most new or modified stationary sources of air pollution must obtain permits from the Department of Environmental Protection. One permit

is for construction, the other for operation. Some sources have operated and currently are operating under a construction permit rather than an operating permit. This act makes it clear that such a source may not operate under a construction permit unless allowed by the DEP. Under the act, operation of a source under only a construction permit would be grounds for DEP to refuse to issue an operating permit.

The act also gives the Commissioner authority to require an emission test of the source before issuing the operating permit, if determined necessary. The results of the test must be made available to the legislative body of the town in which the source is located. Under the act, the Commissioner may establish regulations requiring the owner of the source to pay a fee to cover DEP's cost of performing the emissions test.

PA 83-561, AN ACT CONCERNING THE MOTOR VEHICLE EMISSIONS INSPECTION PROGRAM, upon passage, except the reduction in the minimum repair cost limit takes effect January 1, 1984.

The act reduces, from \$70 to \$40, the maximum amount a person can be required to spend on repairs necessary to comply with the motor vehicle emis-

sions inspection program exclusive of the costs to repair or replace a required air pollution control device which has been removed, dismantled or made inoperative. If repairs are required in excess of this amount, the vehicle must be given a waiver from compliance for "unreasonable cost of repair." Prior law authorized such waivers, but did not make them mandatory.

The act also requires the transportation committee to review certain operational aspects of the current program as well as the feasibility of modifying the program to include annual safety inspections, biennial emissions inspections, and emissions inspections of diesel-powered vehicles. The committee must report any findings and recommendations to the full legislature by January 1, 1984.

In addition, the act requires the Commissioner of Motor Vehicles to provide the transportation committee with a monthly report of the program's operations. The Commissioner of Environmental Protection also must provide the committee with quarterly reports on emissions reductions resulting from the emissions inspection program and an annual report on State air quality. ■

(Continued Next Month.)

## 'Tis the Season . . .

The holiday season is approaching! Time to order gift subscriptions to DEP's Citizens' Bulletin. At just \$5 per year (\$9 for two years) the Bulletin makes a great stocking stuffer. Simply send the form below, with check or money order, to Ed., DEP Citizens' Bulletin, Rm. 112, State Office Building, Hartford, CT 06106.

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# Take Our Advice

## From home gardening to fishing gear technology, the Cooperative Extension Service has the answers

By Susan Subak, Environmental Intern

The University of Connecticut Cooperative Extension Service advises the public on matters such as gardening, youth development, agriculture, livestock, nutrition, food preservation, and housing. The service operates an extension office in each county in Connecticut staffed with field agents and experienced volunteers who answer individual inquiries, provide workshops and informational meetings and distribute printed educational material for the public.

The Cooperative Extension Service was founded in 1914 as a partnership of the United States Department of Agriculture and the land-grant universities and presently has 1.5 million volunteers nationwide. The University of Connecticut Cooperative Extension Service, with 6,309 volunteers contributing 378,574 working hours, is the largest state agency user of volunteers. It is funded on the local, state, and federal levels and provides educational programs at all levels -- neighborhood, community, town, county, area and state.

**AGRICULTURE:** Agricultural agents and specialists in the University's College of Agriculture and Natural Resources help Connecticut farmers use the latest technology to produce, store and market their farm products.

**CONSUMER EDUCATION:** The staff provides information on consumer goods, managing home finances and fighting inflation.

**EXPANDED FOOD AND NUTRITION EDUCATION PROGRAM:** This program, specially funded by the U.S. Department of Agriculture, helps families with limited incomes and limited resources to improve their nutrition.

**FOOD PRESERVATION:** "Master food preservers" provide information about storing, freezing and canning food in the late summer and early fall.



Susan Subak photos

Horticultural agent Fred Nelson and volunteer "master gardener" Linda Bunk answer the public's questions at the Connecticut Cooperative Extension Service office in Hartford.

A summary of the extension services:



4-H: Young people, age 7 to 19, participate in clubs, camps and short term projects on topics such as public speaking, career opportunities, nutrition, bicycle safety, gardening, care of animals, creative arts and clothing. 4-H programs are also offered to enhance school curriculums in some subject areas.

**HORTICULTURE:** Staffed by volunteer "master gardeners," the horticulture team answers questions about planting and maintaining gardens, plant insects and diseases and pesticide use. Extension agents mail free copies of their newsletter, "Home Gardening Notes," and periodically send pertinent material to their list of home gardeners. The master gardeners are available for consultation between April and October. The horticulture agents also provide greenhouses and the horticultural industry with results of current research. And CES offers a soil testing service at \$2.00 per sample.

**MARINE ADVISORY SERVICE:** The service is funded in part by the National Oceanic and Atmospheric Administration's Sea Grant Programs. It participates in fisheries management projects, and helps identify research needs. In addition, the service advises the public on fishing gear technology. (See Citizens' Bulletin, April, 1983.)

A list of services available by county:

**FAIRFIELD:** Agriculture, Child Development, Consumer Education, Expanded Food and Nutrition Education, Food Preservation, 4-H, Home and Commercial Horticulture, Home Economics.

**HARTFORD:** Agriculture, Community Resource Development, Consumer Education, Expanded Food and Nutrition Education, Family Living, Food Preservation, 4-H, Home and Commercial Horticulture, Home Economics, Livestock.

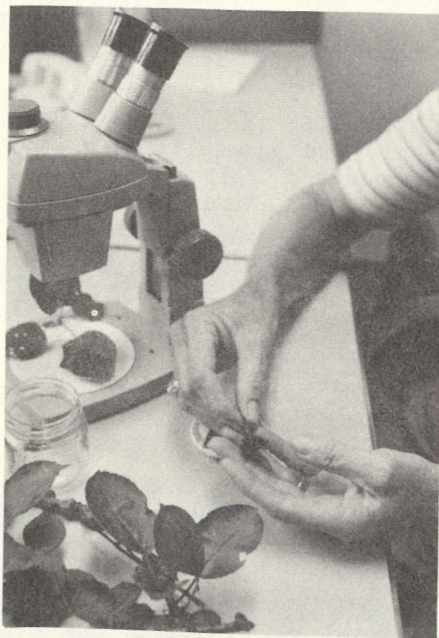
**LITCHFIELD:** Agriculture, Consumer Education, Dairy, Food

Preservation, 4-H, Home Economics, Livestock.

**MIDDLESEX:** Community Planning, Consumer Education, Food Preservation, 4-H, Home Economics, Housing.

**NEW HAVEN:** Agriculture, Clothing and Textiles, Consumer Education, Expanded Food and Nutrition, Food Preservation, 4-H, Home and Commercial Horticulture, Home Economics, Housing.

**NEW LONDON:** Agriculture, Consumer Education, Environmental Education, Food Preservation, 4-H, Home Economics, Poultry.



*Horticultural agent Fred Nelson examines bees.*

**TOLLAND:** Dairy, Family Living, Food Preservation, 4-H, Home Economics, Home Horticulture, Poultry.

**WINDHAM:** Agriculture, Consumer Education, Dairy, Food Preservation, Forestry, 4-H, Home Economics, Livestock.

#### COUNTY EXTENSION OFFICES:

Fairfield County Extension Service  
RD #2 Box 165A  
Bethel, CT 06801  
797-4176

Hartford County Extension Service  
1280 Asylum Avenue  
Carriage House  
Hartford, CT 06105  
241-4940

Litchfield County Agricultural Center  
P.O. Box 607  
Litchfield, CT 06759  
567-9447

Middlesex County Extension Center  
Haddam, CT 06438  
345-4511

New Haven County  
670 Wintergreen  
Hamden, CT 06514  
789-7865

New London County  
562 New London Turnpike  
Norwich, CT 06360  
887-1608

Tolland County  
24 Hyde Avenue  
Vernon, CT 06066  
875-3331

Windham County Agricultural Center  
Brooklyn, CT 06234  
774-9600

The Connecticut Cooperative Extension Service also operates 4-H and nutrition programs in three urban areas:

Bridgeport  
1374 Barnum Avenue  
Bridgeport, CT 06610  
579-6307

Hartford  
2550 Main Street  
Hartford, CT 06120  
241-4170

Waterbury  
17 Willow Street  
Waterbury, CT 06710  
755-4840

The Connecticut Cooperative Extension Service operates a marine advisory service.

University of Connecticut Marine Advisory Service  
Building 24, Rm. 108  
Avery Point  
Groton, CT 06340

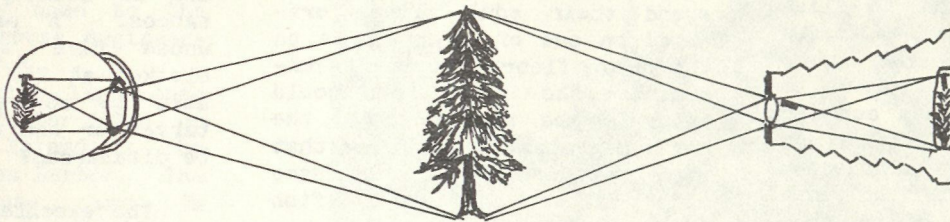


# Nature Notes

## The Eyes Have It

By Penni Sharp

Illustration: Penni Sharp



*Both eyes and camera have a lens which focuses the image. The image is then projected onto the light-sensitive retina of the eye or light-sensitive film of the camera.*

For most animals, the eye is the most important organ for finding out about the world around them. In fact, the very survival of animals depends upon how capable they are of finding food and avoiding their enemies, and these are skills which require vision. Without eyes, success would be difficult.

Compared to other sense organs, the eyes can cover great distances. To taste or touch something requires proximity and physical contact. Although it is possible to smell and hear things at some distance, only the eyes can take us vast distances beyond the range of our other senses. On clear nights we can see the lights of stars trillions of miles away. Eyes also provide information on distance and direction, on size and shape, on motion and depth.

The eyes of animals vary in shape, size and position. Much can be told about an animal by considering its eyes. For

example, predator animals such as the owl, the fox, and the wolf tend to have eyes to the front of their heads. This frontal eye positioning gives an animal binocular vision and enables it to judge distances and to locate and capture prey species. Animals like the rabbit, sparrow, and squirrel have eyes at the sides of their heads giving them good peripheral vision, and enabling them to see approaching enemies from almost all sides. This placement of eyes produces monocular vision, and animals with it see only in two dimensions, breadth and height. Depth perception is almost totally lacking for animals with monocular vision.

Despite the differences in structure, eyes of different animals function in a similar manner. The way their eyes work is most easily understood if the eye is compared to a camera. Both eye and camera have an opening which permits light to enter. In the eye the iris opens and closes to control the amount of light enter-

ing, and in the camera the diaphragm performs this function. Both eyes and camera have a lens which focuses the image. The image is then projected onto the light-sensitive retina of the eye or light-sensitive film of the camera. Once an image is "projected" onto the retina, nerve fibers pick up the signals and transmit them to the brain where a mental image is formed.

The retina of the eye is a mosaic of visual receptor cells. These are commonly called rods and cones, named for the shape that they usually have in mammalian eyes. Rods and cones differ markedly in the way they function. The cones are sensitive to good illumination and produce vision during daylight or bright conditions. Rods are effective in dim light. In the human eye, the cones are clustered in the center of the retina with the rods at the periphery. On the next clear night, try looking at a dim star directly and then off to one side. It will like-



ly appear brighter at the edge of your field of vision where the image falls on the rod cells.

Almost without exception, every form of animal life, no matter how simple, responds to some degree to darkness and light. Even one-celled protozoans are equipped with an eye spot or light receptor that enables them to detect changes in light. Other creatures have more complex eyes. Insects, for example, have two types of eyes, simple and compound. Simple eyes react to light changes but do not form images. Compound eyes are made up of hundreds of lenses joined together. These lenses can form images. The surface of a compound eye resembles a honeycomb made up of many individual eyes, each capable of transmitting information to the brain. The lenses of a compound eye do not adjust, thus the images recorded are probably quite fuzzy. However, when the images from all of the eyes come together, the brain likely has a good image of the animal's surroundings. Anyone who has tried to swat a fly knows how well they see. Each of their eyes is equipped with over 4,000 lenses. Dragon flies, which feed on the wing and must be able to see their prey, have two compound eyes with as many as 30,000 compound lenses in each. At the other extreme are certain species of ants, which, due to their dark, subterranean life, have less than ten lenses per compound eye.

As previously mentioned, the eyes of various higher animals function in a similar fashion, much as our own eyes do. But there are some interesting variations in the structure of the eyes of different vertebrates. Fish, for example, lack eyelids and cannot shut their eyes. On bright days, fish tend to hide in shaded areas of lakes or streams. Fish, particularly predator species such as the northern pike or largemouth bass, see relatively well in dim light although it takes

some time for their eyes to adjust to changes in light intensity.

Despite the fact that fishes' eyes are located to the sides of their heads, predatory fish have binocular vision to a fair degree, in addition to monocular vision. This enables them to strike their prey and also to see their surroundings without having to move their heads.

Among the most unusual eyes belonging to fish are those of certain flatfish. These fish spend their adult lives oriented on one of their sides on the ocean floor. During development, the eye that would otherwise be face down in the sand migrates around so that both eyes end up on the same side, allowing the adult fish to look upwards.

The anableps, or four-eyed fish, is another one with an unusual arrangement. A small fish of tropical America, it swims at the water's surface. The upper portion of each eye views life in the air. The lower half of each eye, structured differently, permits the fish to see underwater.

Birds probably have the best eyesight in the entire animal kingdom. Because of their ability to fly, it is critical that they have well-developed eyesight. In birds, the eye is proportionately very large, making up as much as 15 to 30 percent of the weight of the head. As a comparison, the weight of the average human eye is around one percent of that of the head. Because birds' eyes are so large, there is little room for eye muscles, thus birds have little eye movement. Owls' eyes, a third the size of their heads, are so large that the birds are unable to move them at all. However, an owl can swivel its head nearly 180 degrees, enabling it to observe almost everything around it.

Birds that are prey species have eyes set back on the sides

of their heads giving them good peripheral vision without the necessity of having to move their necks. Predator species have eyes closer to the front of their heads. These birds use both binocular and monocular vision. While aloft and soaring in search of food, an eagle, hawk or other predator species probably uses monocular vision to scan for possible prey. Once a potential meal is spotted, the bird switches to binocular vision. At this point, it is important for the bird to have depth perception and an ability to judge distances. A peregrine falcon, whose dive speed has been clocked at 240 m.p.h., must be able to accurately judge its target or the end result could be disastrous!

The excellent eyesight that birds possess is due to the number of photoreceptor cells that are packed into the eyes' retinas. A hawk may have as many as 1.5 million visual cells in each eye. By comparison, the eye of a man has around 200,000 such cells.

While among birds large eyes generally belong to the predator species, among mammals the largest eyes are found in hoofed animals such as deer, mountain sheep and horses. Many of the hoofed animals have an interesting visual adaptation. Their pupils are horizontal slits, allowing them greater vision from side to side. An interesting contrast is seen in the pupils of some of the predator species, for example felines, whose pupils are vertical slits. This adaptation benefits the animal first by concentrating the field of vision, enabling the animal to focus on the fleeing prey species. Secondly, vertical pupils can shut tighter yet open wider than pupils of other shapes, thus the animal can function well in a range of different light conditions.

Many animals have a tapetum lucidum or extra membrane behind the retina. This membrane acts like a mirror and



Lighthouses have always suggested the mystery and adventure of the sea. The oldest lighthouse of which we have any record was built by the Egyptians around 300 B.C. on the Island of Pharos at the mouth of Alexandria Harbor. Ancient writings tell us that its height was "100 statures of man," or roughly 500 feet, and that it cost 800 talents, a figure that one English historian in the late 1800s estimated to be about \$2,500,000 in today's currency. The Pharos of Alexandria was one of the wonders of the ancient world and it gave its name to the science of lighthouse engineering -- "Pharology."

America's first lighthouse was lit in September 1716 on Little Brewster Island at the entrance of Boston Harbor. The Boston lighthouse was a cone-shaped stone tower illuminated by tallow candles that were later replaced by oil lamps. Lighthouses in the United States were overseen by local coastal authorities until 1789 when the federal government took charge and created a Lighthouse Establishment to manage the twelve light-stations then in existence along the coastlines of the United States.

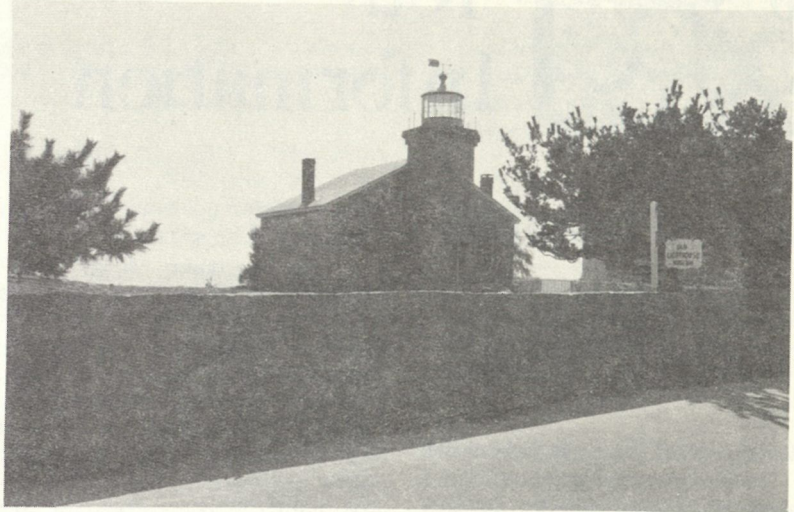
In 1761, Connecticut's first authorized lighthouse was lit at the mouth of the Thames River in New London Harbor. In those days, it was popular to hold a lottery to raise money for projects such as churches, bridges and lighthouses. A successful "New London Lighthouse Lottery" was held and the structure was built. The colonists voted that funds for paying the keeper were to be raised by taxing all ships entering and leaving the harbor. Here are two more of eastern Connecticut's historic lighthouses.



71 Capitol Avenue Hartford, Conn. 06106

# Historic Lighthouses

By Diane Giampa, Public Participation Coordinator



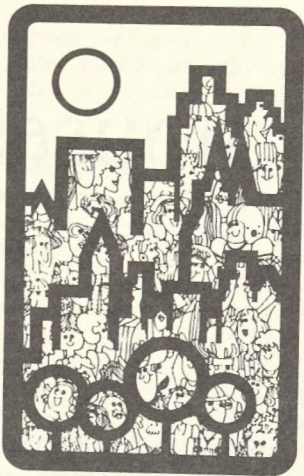
*The original site of the Old Lighthouse of the Borough of Stonington was closer to the tip of Stonington Point, but it was too exposed to the elements there and it had to be moved several hundred yards inland. This second lighthouse was built in 1840 and was designed by John Bishop who tried to use as much of the original stone and materials as possible.*



Charlie Evans photos

*Henry Davis built the Noank Light House in 1868 out of native stone. Now a private home, its tower was once lit by clusters of kerosene lamps grouped behind magnifying lenses. The light was discontinued around 1915, but in the early part of the century it was tended by Captain Thaddeus Pecor, who polished and lit the lamps.*





By Leslie Bieber,  
Citizens' Participation Coordinator

## For Your Information

### EPA --- restored credibility, renewed vigor

When William Ruckleshaus took over the embattled U.S. Environmental Protection Agency (EPA), he appointed Michael Deland as Administrator of the New England Region. Deland recently addressed the Connecticut Environmental Caucus in order to explain what directions the EPA will be taking under the new leadership.

According to Deland, EPA's number one priority will be the restoration of its credibility. Too many people perceived the agency as catering to private industry instead of the public's safety. At the same time, the new administrators will be working to renew the pride and morale of EPA employees. This will include reversing the drain of scientists and researchers away from the agency.

An obvious concern of many in the environmental community is the allocation and distribution of the "Superfund" money for the cleanup of hazardous waste facilities. Deland pointed out that in the eight months prior to Ruckleshaus's appointment, \$11 million were spent on cleanups. Eight weeks after taking over EPA, Ruckles-

haus had approved the expenditure of \$12 million.

In another move aimed at making EPA respond to problems more quickly and efficiently, the regional administrators have been given more responsibility for enforcement activities. For instance, the amount of emergency cleanup money that an administrator can expend without Washington approval has been increased from \$50 thousand to \$250 thousand. This makes it possible for funds to be directed to problem areas without having to wait for all the "red tape" to be handled.

Deland was particularly happy to announce that the EPA will be placing a high priority on the problem of acid rain, something that affects the New England region more than any other area of the country. A new emphasis will also be placed on beefing up the Resources Conservation and Recovery Act (RCRA), the legislation which covers solid and hazardous waste management. In addition, the agency will be judging new projects on a risk assessment, or academic rather than political risk management basis.

Deland responded to the questions posed by Caucus members with a candor that has been absent from previous regional administrators. The general consensus was that the EPA seems to be returning to its mission with a renewed vigor and commitment. ■

## Eyes

From page 20

bounces dim light back through the retina giving the photoreceptors another opportunity to use the light. Nocturnal and crepuscular animals usually have the tapetum, and it is this layer that gives the impression that an animal's eyes glow in the dark. When the eyes of an animal shine back at you at night, it is the reflection of light off the tapetum that you see.

Research has shown that a number of mammals are near-sighted and color blind. In addition to their eyes, these animals rely on well-developed senses of smell and hearing in their efforts for self preservation. Many mammals see only in black, white and varying shades of gray. However, often these species have excellent night vision.

While many mammals are color blind, fish, reptiles and insects have color perception. As a matter of fact, animals which are brightly colored generally possess color vision. Clearly, there would be few adaptive advantages for male birds to have brilliant plumage if the bright colors could not be seen by females and competing males.

The eyes of animals come in a wide variety of sizes and shapes and often have unique features that enable their owners to carry on their daily business with optimum efficiency. Whether you are studying animals or just observing them for pleasure, note their eyes and think of how those particular animals may view the world. The phrase "a bird's eye view" may take on new meaning when one stops to think about exactly what a bird on high may be seeing. ■



# Conference on Environmental Mediation

A one-day conference on environmental mediation will be held on Friday, November 18, 1983 from 9 a.m. to 4 p.m., at the Hartford Graduate Center, 275 Windsor Street, Hartford.

The Connecticut Environmental Mediation Center, along with the Hartford Graduate Center and the Yale School of Forestry and Environmental Studies, is sponsoring the event which will focus on how environmental disputes can be resolved out-of-court through the use of mediation.

The keynote luncheon speaker will be Douglas M. Costle, Esq., former Administrator of the U.S. Environmental Protection Agency.

For further information contact Dorothy S. McCluskey, Director, CEMC, 275 Windsor Street, Hartford, 06120, phone: 278-0472. ■

## A Thanksgiving Children's Event

The American Indian Archaeological Institute, Route 199, Washington, will present a Thanksgiving Story Hour for children on Friday, November 25 at 11 a.m. Cherokee Karen Coody Cooper will relate Native American legends and discuss Thanksgiving traditions and the Indian garden foods enjoyed during the American holiday. Filmstrips presenting an Iroquois story about corn and a

story of Squanto's life with the Pilgrims will be shown. Parents are welcome to attend. Admission is by membership to AIAI or a donation of \$2/adults, \$1/children 6 - 18.

Also at AIAI, the Small World Film Festival, presented by United Technologies Corporation, continues. November's offerings include:

November 12, 13: "Secrets of the Ice" (discussion of glaciers through their history)

November 19, 20: "The Forbidden City" (history of Peking's Ming and Manchu emperors)

November 26, 27: "Peach Gang" (confrontation between the Europeans and the Indians at Plymouth Plantation in the 17th century)

All films are shown at 2:30 p.m. Admission is by membership or a donation of \$2/adults, \$1/children 6 - 18. ■

## Connecticut Off-Season Camping

To provide citizens with the pleasures of off-season camping, William F. Miller, Director of the Office of State Parks and Recreation, announces the areas designated to be utilized during the fall/winter camping season, effective through February 28, 1984.

WESTERN DISTRICT  
(485-0226)

American Legion State Forest, Austin Hawes campground, 15 sites, midway between Pleasant Valley and Riverton on West River Road.

Housatonic Meadows State Park, 25 sites, 1 mile north of Cornwall Bridge on Route 7.

Kettletown State Park, Pump Field, 30 sites, 3.5 miles south of I-84, Kettletown Road to Georges Hill Road, 0.7 mile to entrance.

EASTERN DISTRICT  
(295-9523 or 344-2115)

Cockaponset State Forest, 12 sites, 2.5 miles west of Chester on Route 148, north on Cedar Lake Road, 2 miles.

Pachaug State Forest, Mt. Misery Area, 22 sites, off Route 49, north of Voluntown.

Mashamoquet Brook State Park, 20 sites, Route 44, Pomfret (Open only until November 1).

Mashamoquet Brook State Park, Pomfret, Indian Chair Youth Group Area (Camping by advanced arrangements only. Phone 928-6121 between 8 a.m. and 3:30 p.m.).

Lots will be issued on a first come, first served basis. The camp stay is limited to three nights with an absence of 24 hours before returning. There will be no charge. Dogs on a leash are permitted at these camping areas during this off-season period only.

The areas were established to provide as wide a geographical coverage as possible and to consider the proximity to other fall and winter uses such as hunting, snowmobiling, skiing, etc.

To insure a pleasant camping experience for everyone, the Office of State Parks and Recreation requests the public's full cooperation in complying with the Rules and Regulations of the DEP. Campers are also requested to take their refuse home with them and to report any acts of vandalism, littering or general misuse of the areas to the managers or patrolmen. ■



# Trailside Botanizing

By G. Winston Carter

## Scarlet Oak (*Quercus coccinea*)

The Scarlet Oak stands out among the autumn foliage because of its brilliant red leaves. Its name is well chosen not only because of the color of its leaves but also because its female flowers are red in the spring and its inner bark is reddish.

The flowers usually appear in April or May just as the leaves are unfolding. The acorns mature at the end of the second growing season. A heavy crop of acorns is usually followed by several years of light production. The reddish brown acorn is covered by 1/3 to 1/2 inches of scales which may be shiny, and the tip of the acorn is often marked by faint rings.

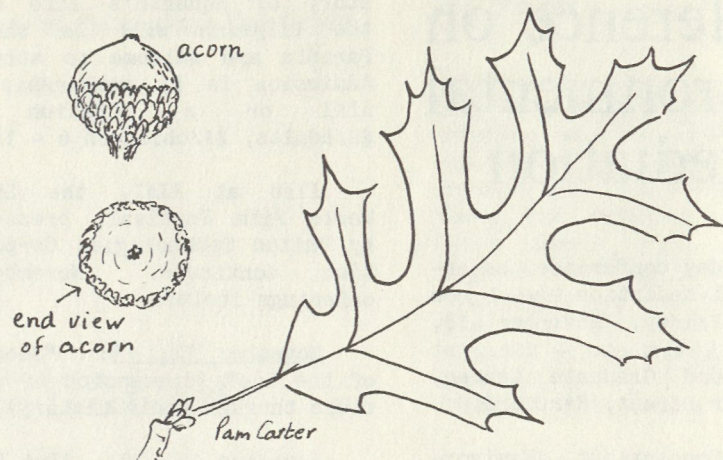
The leaves of Scarlet Oak are bristle-tipped, deeply

lobed and have a glossy appearance. The midrib is yellow. The red leaves persist on the tree sometimes until spring. This was a common tree that greeted the pilgrims when they first landed on the Atlantic shore. It must have been a welcome sight.

Scarlet Oak occurs in a variety of soils but is usually found growing on dry sandy soil on hilltops and sandy plains. It is intolerant of shade and grows rapidly, particularly on better sites which are usually occupied by more tolerant spe-

cies. This species does not live as long as many of the slower growing oaks such as White Oak.

The wood is inferior to many of the other species of oak but is used for wagons, boats, chair stock and agricultural implements. Scarlet Oak is valued as an ornamental because of its great beauty and minimum need for care. The acorns are important to wildlife including white-tailed deer, squirrel and ruffed grouse as well as many larger song birds.



## DEP Citizens' Bulletin

State of Connecticut  
Department of Environmental Protection  
State Office Building  
Hartford, Connecticut 06106

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